SYNCHRONOUS REDUNDANT DISK ARRAY CONTROLLER

Abstract of the Disclosure

A disk drive array controller and method carries out disk drive data transfers not only concurrently but also synchronously with respect to all of the drives in the array. For synchronous operation, only a single-channel DMA is required to manage the buffer memory. A single, common strobe is coupled to all of the drives for synchronous read and write operations, thereby reducing controller complexity and pin count. A ring-structure drive data bus together with double buffering techniques allows use of a single, common shift clock instead of a series of staggered strobes as required in prior art for multiplexing/demultiplexing buffer memory data, again providing for reduced controller complexity and pin count in a preferred integrated circuit embodiment of the new disk array controller. Methods and circuitry also are disclosed for generating and storing redundant data (e.g. "check" or parity data) "on the fly" during a write operation to a RAID array. Techniques also are disclosed for reconstructing and inserting missing data into a read data stream "on the fly" so that a disk drive failure is transparent to the host.